Veris White Paper

VWP02

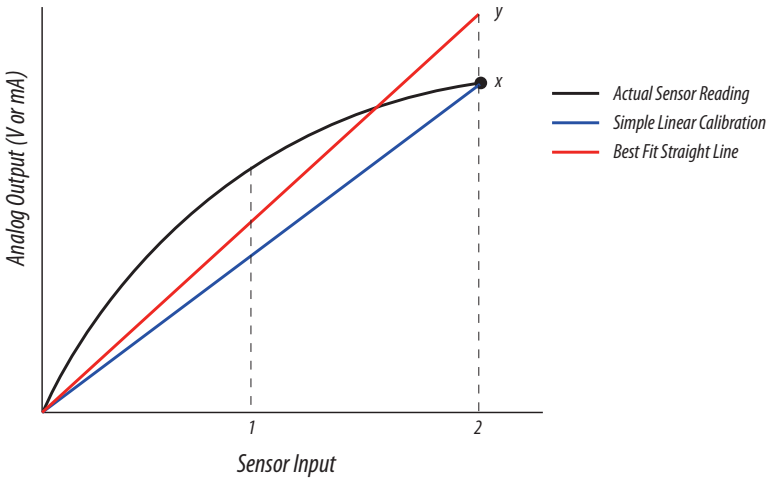
Best Fit Straight Line Calibration

Introduction

In practice, the relationship between the signal input and the sensor output (voltage or current) in a calibration curve is not perfectly linear. To more accurately interpret sensor data, it is necessary to calculate the best fit straight line (BFSL) through the calibration points and the origin. The BSFL is the line with the minimum deviation from the curve.

Theory

As illustrated, the simple linear calibration results in a large deviation from the sensor readings at the midpoint (1). The BFSL, however, is a better approximation of the readings. The deviation at the midpoint is effectively halved, and it is offset by a similar deviation at the endpoint (2).



To calibrate a sensor using the BFSL, adjust the panel so that when the sensor reading is at full scale (x), the output will be set to the value at point (y). This will halve the overall linear error.

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